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ABSTRACT

Noting the growing interest in recent years in the use of mentalistic measures in studying the reading process, this paper draws upon findings of studies conducted at the Hebrew University in Israel to show how mentalistic measures have been used effectively in reading research. Following a discussion of the unique role mentalistic data can play in reading research, the paper examines the nature of "reading strategies"--mental processes readers consciously choose to use in accomplishing reading tasks--and reviews the verbal report methods involved in their study. It then looks at specific studies from the Hebrew University that have used verbal report methods in four areas of investigation: (1) developing a taxonomy for reading strategies, (2) checking the appropriateness of mentalistic measures for different populations, (3) determining similarities between first language and foreign language reading, and (4) describing the taking of reading comprehension tests. Four pages of references conclude the report. (FL)

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Mentalistic Measures in Reading Strategy Research: Some Recent Findings[1]

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ABSTRACT

In recent years there has been a growing interest in the use of mentalistic measures in studing the reading process, both for insights such descriptions may provide for teachers in their teaching and for readers in their reading. This paper begins by discussing the unique role that mentalistic data may play in research on reading. Then "reading strategies" and verbal report methods for studying them are defined. Lastly, the paper reports on Hebrew University student studies which have used verbal report techniques in four major areas of investigation: (1) developing a taxonomy for reading strategies, (2) checking the appropriateness of mentalistic measures for different populations, (3) determining similarities between first-language and foreign-language reading, and (4) describing the taking of reading comprehension tests. The findings presented are meant to be illustrative of the types of empirical data that can be obtained through the use of mentalistic measures.

INTRODUCTION

In recent years there has been an increasing interest in describing the reading process, both for the insights that such descriptions may provide for teachers in their teaching and for readers in their reading. The focus has been broadened to include not just the product of reading -- namely, some indication of reading comprehension -- but the processing that produces or does not produce comprehension. It has become increasingly clear that various traditional means of assessing what the reader is comprehending are limited in their descriptive power. Teacher observation or even results on reading comprehension tests, for example, may not give an accurate picture of an individual's reading ability beyond basic recoding (symbol to sound) and decoding (sound to meaning) skills.

At the more basic level of recoding and decoding skills, as manifested in beginning reading, external observation may well be an effective way to obtain reading strategy data. In fact, in some research situations it may be one of the only viable ways. For example, Naveh (1985) was interested in investigating the reading strategies of nine illiterate adult Ethiopian immigrants to Israel during their first several months of intensive Hebrew-language instruction. She did not speak any Amharic, they did not speak any Hebrew, and there was no translator readily available. She had to rely on giving the learners explicit examples of each oral reading task requested of them (such as reading words and phrases and breaking down and building sentences), and then on doing close-order observation of every strategy that could be inferred from the learners' reading output.

This observational approach produced a large sample of strategies observed to be in use by those illiterate adults who were less proficient

beginning readers: reading synthetically rather than globally, rehearsing a word before reading it aloud to a teacher, being dependent on the first part of a word in order to recognize its meaning, and having to read all the words in a string in order to pick out a desired word rather than scanning to find the word (Naveh 1985). As external as many of these initial reading behaviors may have appeared, it was still the case that the list of strategies obtained was not verified by the readers themselves, and so some of the inferred behaviors may not have been accurate.

When students read silently for the meaning of connected discourse, teachers can only guess what strategies are being used. It has become evident that learners may arrive at false conclusions about the meaning of texts for reasons of which teachers are unaware and that some of those reasons may in fact be counter-intuitive to the teachers. Oral recitation in front of the teacher and the class -- beyond the basic recoding and decoding levels -- may not solve this problem because such reading generally does not mirror silent reading. Often when reading silently, readers skip words and phrases in their pursuit of meaning. They also make regressions to pick up the thread. In oral recitation, they read word for word, focusing more on correct pronunciation and punctuation than on a deep understanding of what they are reading. Thus, oral recitation is an activity which may give a misleading impression about the reading abilities of students, especially if it is used, as in "miscue analysis" (Goodman 1973), to determine the process of reading for meaning (see Neuman 1978; Engkert and Semmel 1981, Leu 1982).[2]

Tests of reading comprehension have also been found to have their limitations, given the numerous techniques that readers have developed for obtaining correct answers on such tests without fully or even partially understanding the text. Fransson (1984), for instance, illustrates how

respondents' fixation on specific questions while reading may result in their no longer proceeding via the text but rather around it. Rather than indulging in deep-level processing, they engage only in surface-level processing adequate for the given question, particularly if the response format for the question is of the short-answer or multiple-choice variety.

Given the limitations of observation of oral recitation and the analysis of test scores in accurately assessing reading comprehension skills, researchers are becoming more interested in mentalistic measures. In a mentalistic approach to reading, if readers read aloud, such oral reading is not recitation. Instead, the readers are simply externalizing a process that might otherwise be subvocalized. In other words, they now mumble out loud, as well as adding on any commentary that normally comes to mind while reading. In a mentalistic approach to the assessment of reading ability, the respondents report on their processing of both the text that they read and of the questions that accompany the texts. They also describe how they arrive at answers to questions. Research in both native language reading (e.g., Olshavsky 1976/1977, Baker and Brown 1984, Wagoner 1983) and in second language reading (e.g., Hosenfeld 1984) have demonstrated that verbal report protocols obtained through tapping the mental processes of readers have produced key insights into the processes involved in reading. Insights are also being obtained as to how students actually take reading comprehension tests as opposed to what they are expected to be doing (Cohen 1984b).

An initial focus of mentalistic studies on the reading process was to identify good and bad reading strategies so as to train readers in the use of "good" ones. It has currently become clear that such an approach was simplistic in that strategies may not be inherently good or bad for a given reader. Rather, they may or may not promote successful comprehension of a text, depending on the particular reader, the particular text, the

context in which the reading is going on, and the choice of other strategies in conjunction with that one. In other words, the selection of a given strategy under a certain set of circumstances may create reading failure even though other strategies promoting comprehension are also in use (Sarig 1985). Hence, there is a current shift in research to deal with the description of reading behavior that promotes or deters comprehension rather than to attempt to describe the "ideal" reader.

This paper is intended to demonstrate ways in which mentalistic measures have been used effectively in research on the reading process at the Hebrew University. The studies to be reported on have all been conducted by students as theses or seminar papers.

READING STRATEGIES AND VERBAL REPORT METHODS FOR STUDYING THEM

"Reading strategies" refer to those mental processes that readers consciously choose to use in accomplishing reading tasks. Such strategies may contribute to successful comprehension or detract from it. In principle, what distinguishes strategies from other processes is the element of choice involved in their selection. In reality, the amount of attention that readers pay to their choice of strategies falls on a continuum from total attention to total lack of attention. If readers are requested to indicate the strategies that they use, it is likely that they would be able to describe even the ones that they are attending to the least, since these are, by definition, within the realm of conscious awareness. They would not, however, be able to describe certain unconscious reading processes.

There are basically three forms of mentalistic data used to discover the strategies that readers use, namely, self-report, self-observation, and self-revelation (Cohen and Hosenfeld 1981, Cohen 1984a, Cohen 1984c). The first, "self-report," refers to learners' descriptions of what they do,

characterized by generalized statements about reading behavior (e.g., "When I have a word I don't understand, I do my best to get its meaning from context. Only if that fails do I go to the dictionary.") or labels they apply to themselves (e.g., "I'm a plodder when reading in another language. I start on the first word and go to the last. I can't skim at all."). Such statements are usually based on beliefs or concepts that the learners have about the way that they are when they read, and are often not based on the observation of any specific event.

"Self-observation," on the other hand, refers to the inspection of specific reading behavior, either while the information is still in short-term memory, i.e., introspectively, or after the event, i.e., retrospectively (usually after 20 seconds or so).[3] Retrospection can be immediate (e.g., within, say, an hour of the event) or delayed (a few hours, days, or even weeks after the event). It appears that the bulk of the forgetting occurs right after the mental event. Thus, data from immediate retrospection may only be somewhat more complete than data from delayed retrospection.[4]

The term "self-revelation" is introduced here to refer to a learner's report that is neither a description of general behaviors, nor based on inspection of specific ones. Rather it consists of "think-aloud" stream-of-consciousness disclosure of thought processes while the information is being attended to.[5] The data are basically unedited and unanalyzed.

Any given report may have different types of data in it. For example, data from self-report studies may include learners' retrospections about specific reading behaviors, just as data from retrospective studies can include generalized pronouncements, extending beyond the observation of a given event. Furthermore, it is sometimes difficult to establish whether respondents are actually <u>thinking aloud</u> -- without analysis -- or whether they are instead <u>observing</u> that behavior, whether introspectively or

retrospectively. For example, for the sentence, "Nuclei contributing to the zygote are transferred between two cells without the formation of obviously specialized gametes," verbal report data could look like this:

> Let me see. "Nuclei contributing to the zygote..." What's a 'zygote'? I'll read on. O.K. The nuclei contributing to it are transferred between two cells. Oh, yeah. I know about this. A zygote is a kind of cell. In this case I used contextual clues to guess the vocabulary word I wasn't sure of.

Most of this report contains think-aloud data, but at the end the reader is self-observing retrospectively -- by analyzing the process of finding the meaning for the unknown word.

READING STUDIES USING MENTALISTIC MEASURES

In the last several years, student theses and seminar papers at the Hebrew University have investigated a number of issues related to the process of reading, employing mentalistic measures. These studies will be noted here as illustrious of the ways that verbal report techniques can be utilized in the area of reading comprehension. The studies have involved four major areas of investigation: (1) developing a taxonomy for reading strategies, (2) checking the appropriateness of mentalistic measures for different populations, (3) determining similarities between first-language and foreign-language reading, and (4) describing the taking of reading comprehension tests.

A Taxonomy for Reading Strategies

In an in-depth study of ten high-school readers of Hebrew native-language and English foreign-language, Sarig (1985; in press) identified a number of strategies, and organized them into four types: technical-aid moves, clarification and simplification moves, coherence-detecting moves, and

monitoring moves (see Figure 1). "Technical-aid moves" refer to the types of reading acts undertaken to facilitate higher-level moves (e.g., skimming for the purpose of determining the macro-frame of the text) and to the types of notes that are taken while reading. "Clarification and simplification moves" refer to semantic-decoding moves, involving a paraphrase of the text for the purpose of simplifying the syntax, the vocabulary, the ideas, or the rhetorical functions. "Coherence-detecting moves" refer to efforts on the reader's part to use textual or extra-textual clues to make the text meaningful -- e.g., through the textual and content schemata, the rhetorical functions displayed in the text, and the ideas and views expressed. "Monitoring moves" refer to conscious strategies for checking on the reading process as it takes place -- e.g., awareness of the task being performed, identification of misunderstanding and incompatibility of formerly interpreted material with newly interpreted material, awareness of other failures in comprehension, and awareness of resources for remedy and likelihood of success.

A taxonomy of this kind provides an effective means for classifying the large array of strategies that emerge from protocol analysis. It also provides a hierarchy from more basic, psychomotor strategies to the higher-level ones, and even suggests how different types of moves complement and interact with one another. For example, let us say that a reader jumps around while reading a text. At the technical-aid level, the occurrence would be analyzed simply in terms of the physical jump from one place in a text to another. At the coherence-detecting level, a rationale may be offered as to why this jump took place: for example, whereas the reader was aware that the textual schemata called for an example at that point in the text, s/he did not feel a need to read that example, but preferred to locate the next main proposition. At the monitoring level, the focus would be

on the extent to which the jump was intentional, i.e., attended to. Unidimensional lists that simply indicate that the reader has jumped from one place to another in the text are not fully describing the move.

Sarig's taxonomy has also proved useful to other researchers. Zupnik (1985a), for example, conducted an in-depth study of two intermediate-level EFL readers, a strong and a weak one, and found the Sarig taxonomy an effective tool in comparing the types of moves employed by the two readers. In her study, the weak reader used more moves and a larger variety of moves than the strong reader, but with less successful results, which seemed to refute Olshavsky's (1976/77) findings that the strong reader uses more strategies than the weak one. The explanation appeared when analyzing the types of moves employed. The poorer reader was involved mostly in clarification and simplification moves (e.g., the identification and analysis of specific vocabulary items), while the stronger reader was focusing more on monitoring moves (e.g., a critical analysis of the questions asked, self-evaluation of reading success, awareness of lack of comprehension). Also, most of the weak reader's moves had a deterring effect on comprehension whereas almost all of the strong reader's moves were comprehension-promoting.

The Appropriateness of Mentalistic Measures for Different Populations

A research question that comes up repeatedly is that of whether verbal report measures are appropriate for, say, young children or adults without formal education. Several of the studies recently conducted in Israel dealt with the issue of different populations. The results have tended to suggest that mentalistic measures have a potential application to a broader population than had been predicted by the researchers at the outset of the studies.

With respect to young respondents, for example, a study by Levy and Weizman (1984) with twenty-four second- and third-grade readers (12 strong and 12 weak in reading) demonstrated that these young readers were quite capable of explaining how they arrived at answers on a Hebrew native-language rational-deletion cloze test. For example, a weak reader, Inbal, was asked how she arrived at the following cloze completion (translated here into English): "All the flowers will choose the color they would like to be and we won't fight and we'll live in punches ." (The word 'peace' was expected.) Using retrospective self-observation, Inbal reported using the word 'punches' "since it was not nice to hit others and get hit because people get hurt that way." In her reading of the sentence, she had extended the negative to the second part of the phrase by mistake, and thus selected a word like 'punches.' Her verbal report helped to clarify for the researcher that she had understood the thrust of the text but not the fact that the coordinate clause had both a negative and an affirmative element in it.

A strong reader, Guy, was asked why he supplied "peace" for the same item on the cloze test. His reply was as follows: "If the anemones argued over what color they would choose to be, then 'we won't fight' shows that the continuation is that they will live in peace."

Based on the successful results of this study, Weizman (1985) did a follow-up study with five second-grade readers, each representing a different level of reading proficiency. In this study, the students were given training in the use of reading strategies. She once again obtained informative verbal report data, which in this case established that the more proficient readers benefited from the training while the less proficient readers did not. The more proficient readers were also more likely to use a rich variety of strategies in a systematic way. She concluded that the training was not appropriate for the weaker readers.

With the desire to improve on the training aspect, Weizman (1986) undertook a third study, this time with 135 third- and sixth-grade pupils, involving training and the use of control groups. The study also includes in-depth verbal reports from a small subsample of the respondents. While the results are currently being written up, the preliminary findings indicate that those students who underwent the training produced higher reading scores than those who did not. The mentalistic studies contributed considerably to providing Weizman with the insights necessary to plan and execute her most recent study.

Another group considered an unlikely source of verbal report data on reading were women in the Tehila Program, a special program for adult study in Israel. These woman had immigrated to Israel from North African countries in the 1960's, were from 40 to 60 years in age, had limited formal schooling, and worked for the most part in menial jobs. Two researchers, Barak and Barak (1985), chose to investigate, among other things, the abilities of these women to make use of titles in reading, to find the central idea, and to skim. The women were asked to provide retrospective self-observation and self-report data. To the surpise of the researchers, the women were able to articulate their level of awareness of strategy use quite successfully. The following is an excerpt from an interview with Esther, 60 years in age and a weak reader:

> Investigator: What do you do when you don't know something in the story?
>
> Esther: When I don't understand, I go back and read the story several times. Just one thing -- I do forget a little even when I read it a second time. I don't know whether to read aloud or silently. I don't know what's good for me. (Translated from Hebrew)

This excerpt reflects self-report data in that it does not refer to any single occurrence of reading behavior, but is rather a statement of more general behavior. The reader's dilemma about whether to read aloud or not indicates a genuine awareness of strategic options, even if the "correct" choice is not clear to her.

The following is an excerpt from an interview with a more proficient reader, Zamira:

> Investigator: How do you handle problems while reading?
> Zamira: I use a dictionary and ask people. I never skip a sentence or word. Everything is important. I read word for word all the time and return to the beginning most of the time if I don't understand. I don't get bored or give up. (Translation for Hebrew)

This is also an example of self-report data. The researchers found that Zamira did not skim at all. Whereas word-for-word reading may be considered a comprehension-deterring strategy at times -- particularly if there is much to read and the material is redundant -- it would appear that it was a comprehension-promoting strategy for Zamira, given her success at reading compared to her peers in the Tehila program.

Determining Similarities Between First and Foreign-Language Reading

In recent years there has been considerable interest in whether reading in a second or foreign language is like that in the first (see Alderson 1984). The use of mentalistic techniques provides yet another avenue for investigating the comparative handling of text by the same reader across languages. In a mentalistic study of two readers of Hebrew as a first language and French as a foreign language, Reuven (50) and Shimon (44), Nevo (1985) sorted the reading strategies obtained through self-revelation (think-

aloud) and self-observation into first-language-only, foreign-language-only, and common strategies.

Among other things, Nevo found that both readers performed grammatical analysis only in the foreign language, as might well be expected. Furthermore, the protocols showed the respondents to have only one strategy each that they used exclusively for first-language reading. In the case of Reuven, the strategy involved asking himself questions about the author's intentions as he read along (a coherence-detecting move, according to Sarig, in press). Nevo suggested that this strategy was not employed in foreign-language reading because the reader was too engaged in lower-level analysis. In the case of Shimon, the strategy unique to first-language reading was that of pronouncing aloud unfamiliar words and expressions as they were encountered in the text. The researcher was surprised to find this strategy among those used in word analysis in the first-language since she expected that the adult reader would no longer indulge in oral recoding (i.e, symbol-sound analysis). Nevo concluded from this case study that successful reading depended both on reading ability and on language ability.

Perhaps one of the most extensive mentalistic studies of reading yet to appear is that recently completed by Sarig (1985). As part of a study of Hebrew native-language and English foreign-language reading among 140 college-bound high school seniors in Israel, Sarig collected lengthy verbal report protocols from a subsample of ten students representing three levels of proficiency. The Hebrew and English texts were equated for difficulty by means of a scale of pragmatic, textual, and lingistic variables assessed by expert readers; a discourse cloze; and a comparative rhetorical analysis between the texts. The respondents were trained in how to provide verbal report data: they received a sheet with examples of mentalistic data, were given a demonstration of think-aloud and introspective techniques by the

researcher, and then practiced verbalizing actively with the researcher supervising and giving support (Sarig, in press).

The major contribution of this study to the comparison of first- and foreign-language reading was the formulation of the four types of reading moves mentioned above (see Figure 1). Another contribution was the finding that readers differ considerably in the way that they tackle a high-level reading task. Sarig's research provided various insights regarding similarities between first- and foreign-language reading. With respect to combinations of strategies, moves in the two languages correlated highly for each of the ten readers. Eight of the ten readers transferred their first-language reading style to reading in the foreign language. Of the two who did not, one was an intermediate reader and the other a poor reader in the foreign language. Sarig interpreted these findings as indicating that ability to transfer reading skills from first to foreign language is not dependent on foreign-language proficiency, but rather is an individual cognitive trait. Likewise, she found that successful transfer of strategies to the foreign language did not necessarily promote comprehension. Both weak and strong readers were characterized by transfer of moves that promoted and deterred comprehension, and in almost all cases the readers differed from one another with regard to the extent of transfer and the degree to which it promoted comprehension.

Sarig also found that differences across individuals characterized both first- and foreign-language reading. There were found to be four dimensions along which individuals differed in their choice of strategies: (1) the unique combination of strategies, (2) the subtask that contributed to success in reading, (3) the frequency of the use of each strategy, and (4) the extent of transfer and whether it had positive or negative effects.

There was only one noticeable area where a given reader's strategies

were found to differ across languages. With respect to clarification and simplification moves, especially the "propositional-decoding" moves, there was a low correlation between comprehension-promoting moves in first- and foreign-language. The explanation that the researcher gave was that this stage of reading is the most language-specific. In other words, it is easier to identify propositions or basic ideas in a first-language than in a foreign language.

Whereas a "short-circuit hypothesis" has been posited stipulating that readers will not transfer their reading skills to the second language if their language proficiency in that language has not reached a certain threshold level (Clarke 1979), Sarig's findings have suggested to her a "compensation hypothesis" -- namely, that when readers lack adequate second-language proficiency, they will rely on first-language strategies more than they do in their first language. This reliance is intended to compensate in part for lack of foreign-language proficiency. This hypothesis is in line with the interactive compensatory model of reading (Stanovich 1980) and with the empirical findings of Perkins (1983) and Haynes (1983).

Describing the Taking of Reading Comprehension Tests

As noted at the outset of this paper, the tests that are relied upon to indicate the comprehension level of readers have been found to have their limitations, given the numerous techniques that readers have developed for obtaining correct answers on such tests without fully or even partially understanding the text. Mentalistic measures have been used to help determine how respondents actually take reading comprehension tests as opposed to what they may be expected to be doing. Recent Hebrew University student seminar papers have provided innovations in two areas of investigation -- in the use of native-language responses to foreign-language

passages and in the use of a response-strategy checklist used after each response. Results from these two areas will now be considered.

In light of a suggestion in the research literature that foreign-language reading comprehension test formats include the use of first-language responses (Laufer 1983, Shohamy 1984), Zupnik (1985a, 1985b) planned two studies to investigate the feasibility of such a suggestion. Although the first study did not include mentalistic data, it provided an empirical basis upon which to interpret the mentalistic data collected in the second study. In her first study, she had twenty Hebrew-speaking intermediate English-foreign-language students (in their first year at the university) perform two tasks on an English text.

In the first task, the students were asked to read the text and were asked five questions in English, two involving definitions, the other three involving a reason, a relationship, and a process respectively. In the first task they were to indicate the precise line(s) in the English text that provided an answer to the question. These responses were collected and then the respondents were asked the same questions again, but this time they were to provide open-ended answers for the questions in Hebrew -- first in rough draft, then in a revised version. Finding the relevant line of text in English was intended to reflect those types of questions that can be answered by quoting from the text, thus encouraging superficial reading (Zupnik 1985b:5). The first-language responses were expected to demand a deeper comprehension of the text.

The results showed first-language responses to reflect a lower level of comprehension than the foreign-language responses (42% average correct on the Hebrew version vs. 59% on the English version). Also, although the correlation between performance on the two forms was significant ($p = .05$),

it was low (r = .45). The researcher concluded that the two tests were in part testing different things. She pointed out that in reading a foreign-language text, it is possible to recognize that x causes y without understanding what y means. She noted that definitions were particularly easy to identify superficially and harder to explain in the native language. The item discrimination results indicated that the better respondents did better both on "locating abilities" (e.g., skimming and scanning), as called for in the English-language responses, and on reading in depth, as called for in the Hebrew-language responses. The better respondents were also more likely to paraphrase the relevant material from the text when responding in their first-language rather than translating word-for-word (85% of responses from the better students, 57% of responses from the weaker students).

The companion study using mentalistic measures was conducted with two respondents, a strong and a weak reader respectively, engaged in the same tasks as described above (Zupnik 1985a). They were both trained to produce think-aloud data and were then asked to provide such data regarding both language tasks before answering the questions in writing. The poor reader was found to make four times as many moves on the English response task (using Sarig's taxonomy; Sarig, in press) than did the strong reader. Both readers made a similar number of moves on the Hebrew response task. As to the type of reading moves or strategies, it was found that the better reader used monitoring strategies most of all in both languages, while the poorer reader relied mostly on clarification and simplification strategies, with very limited use of monitoring strategies. Furthermore, most of the moves of the stronger reader were comprehension-promoting, while those of the poorer reader were often comprehension-deterring. Both of theses studies were seen to confirm the hypothesis that quoting rhetorically-focused foreign-language segments from text encourages more superficial reading than answering in the

first language.

The second piece of innovative research on test taking dealt with the refining of a research methodology for tapping test-taking strategies. The issue under study was whether it is possible to collect introspective and retrospective data from students just after they have answered each item on a test. The approaches reported on in previous work have involved at most a request of respondents after they have finished a subtest or group of items that they reflect back as to the strategies that they used in arriving at answers to those items (see Cohen 1984b). In an effort to provide immediate verbal report data, Nevo (1985) designed a testing format that would allow for immediate feedback after each item. She developed a response-strategy checklist, based on the test-taking strategies that have been described in the literature and on her intuitions as to strategies respondents were likely to select. A pilot study had shown that it was difficult to obtain useful feedback on an item-by-item basis without a checklist to jog the memory as to possible strategies.

Nevo's checklist included fifteen strategies, each appearing with a brief description and a label meant to promote rapid processing of the checklist (see Figure 2). She administered a multiple-choice reading comprehension test in Hebrew first-language and French foreign-language to forty-two 10th graders, and requested that they indicate for each of the ten questions on each test, the strategy that was most instrumental in their arriving at an answer as well as that which was the second most instrumental. The responses were kept anonymous so as to encourage the students to report exactly what they did, rather than what they thought they were supposed to report.

It was found that students were able to record the two strategies that were most instrumental in obtaining each answer. The study indicated

that respondents transferred test-taking strategies from first-language to foreign-language. The researcher also identified whether the selected strategies aided in choosing the correct answer. The selection of strategies that did not promote choice of the correct answer was more prevalent in the foreign-language test than in the first-language version. The main finding in this study was that it was possible to obtain feedback from respondents on their strategy use after each item on a test if a checklist was provided for easy processing. Furthermore, the respondents reported benefiting greatly from the opportunity to become aware of how they take reading tests. They reported being basically unaware of their strategies prior to the study.

CONCLUSIONS

As more research is conducted on the processes involved in reading comprehension, there is increasing clarity as to the cognitive strategies that readers use. As is often the case in research, more recent findings would suggest that some of the early pronouncements were simplistic. For example, we now see that there are not necessarily inherently good and bad strategies, but rather a series of strategies that may or may not promote comprehension, depending on the reader, the text, the context, and the interaction of all of these. The important role that mentalistic measures have in this research effort is to bring to the attention of readers their configuration of strategy use for any given text. Such strategies are within the realm of conscious awareness but are usually not attended to.

This paper has illustrated some of the ways that verbal report tasks can used to obtain data on the reading process and has presented some of the findings as well. We have seen that mentalistic measures have helped to provide ample enough data in order to develop a taxonomy for reading strategies -- one that can help the researcher interpret what at first

appears like a endless array of reading strategy data. We have also seen that mentalistic measures can be used with various populations, from young elementary-school pupils to adults with limited formal schooling. Thirdly, we have seen how verbal report techniques have helped to shed light on the issue of similarity between first- and foreign-language reading. We saw that in many ways the strategies or moves that a reader employs in both languages are the same because the reading skills are transferred over from language to the other. We also identified instances where such transfer of skills does not take place. Finally, in describing the research on the taking of reading comprehension tests, we noted that students may indeed avoid indulging in the very reading comprehension activities the examiner may be wishing to assess. Verbal report data helped to reveal that a difference in response format may change the findings, perhaps even dramatically.

Clearly there is still much work to be done in the area of verbal reports on the processes involved in reading comprehension. The important point is that a technology exists which has much potential. The challenge for researchers is to tap that potential effectively.

FOOTNOTES

1. Revised version of a paper presented at the 20th Annual TESOL Convention, Anaheim, California, March 3-7, 1986.

2. A recent study of fourteen low-level university ESL readers found that results on miscue analysis correlated significantly with performance on cloze items testing for content (Devine 1986). However, the validity of cloze as a measure of connected discourse has been called into question (Alderson 1983, Klein-Braley 1981, Markham 1985).

3. Ericsson and Simon (1980) proposed a model for verbalization processes that is very similar to this one developed by Cohen and Hosenfeld (1981), with slight variations in terminology. They refer to "think-aloud probing," and to "concurrent" and "retrospective verbalizations", rather than to "introspective" and "retrospective self-observation," as in this paper. In their more recent book (Ericsson and Simon 1984), they also distinguish "talking aloud" (i.e., directly into vocalization) from "thinking aloud" (i.e., from thinking to verbal encoding to vocalization).

4. One study had two groups of students retrospect about test items that they had taken -- one group (N = 18) within 6 hours of having taken the test and one group (N = 23) three days later. In the first group, the first student started being interviewed 30 minutes after taking the test, the last student about five hours afterwards. The investigator noted few observable differences in the report data, other than a few more memory lapses among students in the group doing more delayed retrospection (Larson 1981).

5. Mann (1982) describes think-aloud data as that produced when the subject "externalizes the contents of the mind while doing something." Accordingly, an alternative to "self-revelation" could be "self-externalization."

Figure 1

Reading Move Types and Comprehension-Promoting Examples
(From Sarig, in press)

Technical-Aid Moves

1. Marking and copying key elements in the text.
2. Differential marking for difference purposes.
3. Writing oral paragraph summaries in the margin.
4. Using the glossary.
5. Skimming.
6. Scanning.
7. Jumping around.
8. Using notes for higher-level reading moves.
9. Breaking/expanding the decoding unit.
10. Numbering propositions according to their importance.
11. Using captions.

Clarification and Simplification Moves

1. Raising the redundancy level using syntactic simplification.
2. Decoding the meanings of words/groups of words in context through synonyms/circumlocution.
3. Ideational simplification through propositional analysis and through raising the level of redundancy.
4. Paraphrase of the rhetorical function (e.g., "He gives us an example now.").
5. Paraphrase of an indirect question.
6. Paraphrase of an implication (e.g., "He says...This means that...").
7. Paraphrase through concretization (e.g., "It's like...").
8. Paraphrase by means of reasoning (e.g., "If...then, and if...then, but on the other hand...").

Coherence-Detecting Moves

1. Identification of the macro-frame for the text.
2. Use of prior extra-textual content schemata.
3. Identification of people in the text; relating views/actions attributed to them.
4. Identification of key information in the text.
5. Reliance on textual schemata norms to make predictions about text development (e.g., "This is most likely an example now so I'll skip it.").
6. Cumulative decoding of text meaning.
7. Identification of overt and covert cohesive markers; identification of covert coherence ties.
8. Identification of overall textual schema (e.g., "I get it. He shows what's wrong, then what should be done, and finally, how.").
9. Relying on the overt purpose of the text identified earlier.
10. Use of a macro-frame as a starting point in a synthesis task.
11. Identification of the focus of the text (e.g., "This is actually the most important thing here.").
12. Reproduction of the logical development of ideas in the text.

Monitoring Moves

1. Identification of misunderstanding and incompatibility of formerly interpreted material with newly interpreted material (e.g., "What's going on here?").
2. Conscious organizing of task performance (e.g., "First I'll read the whole text through... Next... Then...").
3. Conscious change of planning and carrying out of tasks.
4. Controlled and conscious "hold" moves (e.g., "I'll get back to this later, after I read the example.").
5. Deserting a "hopeless" segment of text (e.g., "I'll just leave that be. I won't be able to understand it anyway, so I don't want to lose any more time on it.").
6. Flexibility of reading rate (in relation to level of difficulty of the decoding unit).
7. Slowing down and using a sing-song intonation to facilitate comprehension.
8. Correction of a mistake in reading.
9. Ongoing self-evaluation.
10. Self-directed dialog, self-questioning.
11. Controlled skipping.
12. Repeated reading of the same decoding unit.
13. Repeated skimming or scanning.

Figure 2

Strategies for Answering Multiple-Choice Reading Comprehension Questions (From Nevo 1985)

1. Background knowledge: general knowledge outside the text.
2. Guessing: guessing without any particular considerations.
3. Returning to the passage: returning to the text to look for the correct answer, after reading the questions and multiple-choice alternatives.
4. Chronological order: looking for the answer in chronological order in the passage.
5. Clues in the text: locating the area in the text that the question referred to and then looking for clues to the answer in that context.
6. Ceasing search at plausible choice: reading the alternative choices until reaching one that was thought to be correct. Not continuing to read the rest of the choices.
7. Process of elimination: selecting an alternative not because it was thought to be correct but because the others did not seem reasonable, seemed similar, or were not understandable.
8. Choosing the exception: suspecting a choice to be the correct answer because it constituted an exception or had something different about it.
9. Length: being drawn to an alternative because it was longer/shorter.
10. Location: being influenced by the location of the alternative within the set of alternatives.
11. Common word: choosing an alternative because it had in it a word that was common -- that was heard all the time.
12. Key word: arriving at an alternative because it had in it a word that appeared to be a key word.
13. Matching the stem with an alternative: selecting an alternative because it had in it a word/words that appeared in the item stem as well.
14. Association: selecting the alternative because it had a word in it that evoked an association with a word in the first language or in another language.
15. Matching the question with the text: selecting an alternative because it had a word/words that also appeared in the text, because it had words similar in sound, meaning, or belonged to the same word familiy, or because it just seemed to be related.
16. Other strategy

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